

A Beacon for Baltimore

NASA's community service effort, designed to promote technology awareness, is exemplified by a ship-tracking satellite beacon for monitoring the voyages of Baltimore's goodwill clipper

Last spring, the square-rigged schooner *Pride of Baltimore* failed to make a scheduled stop at Norfolk, Virginia on its goodwill tour of the United States. For several days, officials of the City of Baltimore—which owns the reconstructed 19th century clipper ship—tried without success to make contact with the *Pride*. Ships and aircraft of the Coast Guard, Navy and Air Force searched the Atlantic but failed to locate the schooner. She was feared lost.

After eight days out of touch, the *Pride* sailed into Delaware Bay intact, its crew unaware of the widespread concern about its fate. The *Pride*, reported Captain Charles F. Whitcomb, had been driven off course by severe storms, thus was unable to meet its schedule of port appearances. The ship's navigational system had been in good working order and her skipper knew the *Pride's* position at all times. Efforts to make contact had failed because the schooner had been blown beyond the relatively short range of the ship's radio equipment. So the *Pride* had not really been in serious trouble, but Baltimoreans had nonetheless been alarmed.

"That will not happen again," says Thomas F. Norton, executive director of Baltimore Operation Sail, Ltd., a non-profit corporation jointly financed by the City of Baltimore and private companies. Norton's organization operates the ship under a charter arrangement; it is used as a floating ambassador of goodwill to promote Baltimore's industries and tourism through open house inspections and business receptions held on board at the *Pride's* many ports of call.

The reason it will not happen again is that the ship is now equipped with a NASA-developed satellite beacon installed by Goddard Space Flight Center, a neighbor of Baltimore. The simple 10-pound beacon, affixed to the *Pride's* mainmast, allows Baltimore Operation Sail to keep track of the ship on its voyages to distant places. Once every minute, the compact, battery-powered unit sends a radio signal to NASA's Nimbus-6 research satellite. Nimbus relays the signals to Goddard, where the frequency shift of successive signals provides information for computing the ship's latitude and longitude.

Soon after its installation on the *Pride*, the beacon had an opportunity to demonstrate its utility. Returning from a tour of the Great Lakes and the St. Lawrence Seaway, the ship was overdue for a scheduled appearance at Stamford, Connecticut. It was hurricane season and storms were reported along the east coast of the United States, so Baltimoreans were once again concerned. Although the *Pride* now has a long-range radiotelephone—a gift from a business firm—Operation Sail's Norton was unable to contact the ship because of weather-induced radio interference. So he called Goddard Space Flight Center, requested a position fix and got it promptly; the *Pride*, it turned out, was sitting out a storm in

High on the mainmast of the clipper Pride of Baltimore, crew members are installing a NASA-developed satellite beacon which enables continual tracking of the ship as she roams the seas on goodwill tours.

another Connecticut port. The beacon has been extremely useful on many other occasions, Norton reports. When he has no urgent need to communicate with the ship but simply wants to know if it is maintaining schedule, a call to neighboring Goddard gets him a quick answer far less expensively than if he used the high seas radiotelephone.

The satellite beacon, manufactured by Handar, Inc., Santa Clara, California, was originally developed by Goddard for a major meteorological experiment in which Nimbus-6 gathered data from hundreds of instrumented balloons. It has since been used in a variety of spinoff applications, for example, tracking the Double Eagle II on the first successful balloon crossing of the Atlantic in 1978. It has also been used to track explorers and scientific expeditions in remote areas; on icebergs to predict drift routes as an aid to shipping; on buoys to trace current patterns for oceanographic and environmental studies; and as a means of following polar bears in their Arctic wanderings.

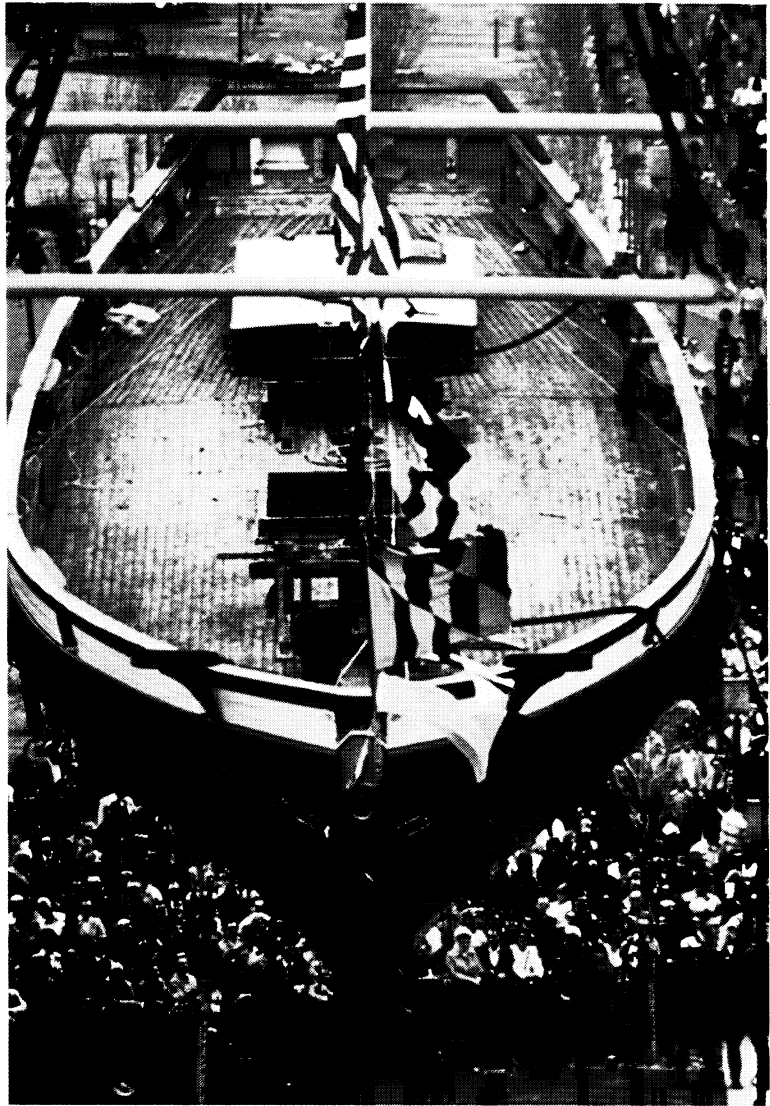
Use of the beacon aboard the *Pride of Baltimore* exemplifies a special area of NASA's technology transfer program: service to communities through demonstration of advantageous technology in the interests of broadening technology awareness. Such services—to community groups, state and local governments, medical institutions and other organizations—are intended to show how the application of new technology may help solve major problems or provide better ways of meeting public needs, thereby inspiring community sponsorship of beneficial technology applications.





*The Pride of Baltimore, a modern
representation of the fast clipper ships
that operated from Baltimore harbor
in the 18th and 19th centuries.*

At Baltimore's Inner Harbor, the Pride was launched in February 1977, crane-lowered into the water for later completion of her rigging and stowing of ballast; she was commissioned in May 1977. Built and owned by the City of Baltimore, financed by public funds and by contributions from business and civic organizations, the ship serves as a roving promotional vessel for the Chesapeake port city.



Visiting scores of ports annually, the Pride of Baltimore promotes the city's industry, tourism and convention business through open house days and private receptions on board wherever she sails. The Pride's crew is made up of young men and women, few beyond their mid-twenties, who live and work in the manner of privateer sailors of the War of 1812 era.

